4.A.—A complete listing of the claims with new numbering as they would appear after allowance

Claims:

What is claimed is:

- 1. A process of removing sulfur compounds and particulates from a gas comprising the steps of (a) spraying separately controlled functional amounts of a chemical reagent and water into the flue gas inside an enclosure wherein said enclosure has an inlet and an outlet for the gas; and (b) collecting the products of the chemical reaction and particulates inside said enclosure with water condensate on a solid surface, also inside said enclosure, whose temperature is kept from exceeding the dew point temperature of the gas by heat transfer to an external cooling means.
- The process according to claim 1 wherein chemical reagent and water are sprayed into the gas by an injector.
- 3. The process according to claim 1 wherein said external cooling means is a plurality of air-cooled cooling fins.
- 4. The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a plurality of scrapers.
- 5. The process according to claim 1 wherein the amount of chemical reagent is controlled by a chemical reagent supply flow controller.
- 6. The process according to claim 1 wherein the amount of water is controlled to prevent supersaturating the gas by a water supply flow controller.
- 7. The process according to claim 1 wherein said external cooling means is a water jacket.
- 8. The process according to claim 1 wherein said external cooling means is a refrigerant.
- 9. The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a water spray.

- 4.B.—A complete listing of all of the claims as originally submitted (including withdrawn claims)
- A process for removing sulfur compounds and particulates from a flue gas comprising the steps of:
- a) injecting a controlled mixture of a chemical reagent and water into the flue gas, and
- b) compelling said flue gas to interact with a solid surface.
- 2. The process of Claim 1 wherein said solid surface is inside an enclosure.
- 3. The process of Claims 1 and 2 wherein said enclosure has an inlet means for admitting said flue gas into said enclosure.
- 4. The process of Claims 1 and 2 wherein said enclosure has an outlet means for allowing said flue gas to exit said enclosure.
- 5. The process of Claim 1 wherein said solid surface is cooled by a cooling means to keep the temperature of said solid surface from exceeding the dew point temperature of said flue gas.
- 6. The process of Claim 1 wherein said solid surface is cleaned of condensate and collected particulates by a cleaning means.
- 7. The process of Claim 1 wherein said controlled mixture comprises: an amount of water which will not cause said flue gas to be supersaturated, and an amount of chemical reagent which is a function of the amount of sulfur compounds in said flue gas.
- 8. The process of Claim 1 wherein said controlled mixture is sprayed into said flue gas by an injector means.
- 9. The process of Claims 1 and 8 wherein said controlled mixture is delivered to said injector means by an injection pump means.
- 10. A process of concurrently removing sulfur compounds and particulates from a gas such that the gas is relatively dry after undergoing said process comprising the steps of
- (a) spraying a mixture of chemical reagent and water into the gas inside an enclosure while separately controlling the components of said mixture; and
- (b) collecting the products of the chemical reaction and particulates inside said enclosure with the condensate on a solid surface, also inside said enclosure, whose temperature does not exceed the dew point temperature of the gas.

- 11. The process according to claim 1 wherein said mixture is sprayed into the gas by an injector means.
- 12. The process according to claim 1 wherein said enclosure has an inlet means to allow entry of the gas.
- 13. The process according to claim 1 wherein said enclosure has an outlet means to allow exit of the gas.
- 14. The process according to claim 1 wherein said solid surface is cooled by a cooling means.
- 15. The process according to claim 1 wherein said solid surface is cleaned of collected condensate, products of the chemical reaction and particulates by a cleaning means.
- 16. The process according to claim 1 wherein the amount of chemical reagent in said mixture is controlled by a chemical reagent supply flow control means.
- 17. The process according to claim 1 wherein the amount of water in said mixture is controlled to prevent supersaturating the gas by a water supply flow control means.
- 18. The process according to claim 1 wherein said external cooling means is a water jacket.
- 19. The process according to claim 1 wherein said external cooling means is a refrigerant.
- 20. The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a water spray.

- 4.C.— A complete listing of all of the claims with the proper status identifiers (brackets for deletions and underscoring for additions)
- 1. (canceled) A process for removing sulfur compounds and particulates from a flue gas comprising the steps of:
- a) injecting a controlled mixture of a chemical reagent and water into the flue gas, and
- b) compelling said flue gas to interact with a solid surface.
- 2. (canceled) The process of Claim 1 wherein said solid surface is inside an enclosure.
- 3. (canceled) The process of Claims 1 and 2 wherein said enclosure has an inlet means for admitting said flue gas into said enclosure.
- 4. (canceled) The process of Claims 1 and 2 wherein said enclosure has an outlet means for allowing said flue gas to exit said enclosure.
- 5. (canceled) The process of Claim 1 wherein said solid surface is cooled by a cooling means to keep the temperature of said solid surface from exceeding the dew point temperature of said flue gas.
- (canceled) The process of Claim 1 wherein said solid surface is cleaned of condensate and collected particulates by a cleaning means.
- 7. (canceled) The process of Claim 1 wherein said controlled mixture comprises: an amount of water which will not cause said flue gas to be supersaturated, and an amount of chemical reagent which is a function of the amount of sulfur compounds in said flue gas.
- 8. (canceled) The process of Claim 1 wherein said controlled mixture is sprayed into said flue gas by an injector means.
- (canceled) The process of Claims 1 and 8 wherein said controlled mixture is delivered to said injector means by an injection pump means.
- 10. (currently amended) A process of [concurrently] removing sulfur compounds and particulates from a gas [such that the gas is relatively dry after undergoing said process] comprising the steps of
- (a) spraying [a mixture] <u>separately controlled functional amounts</u> of a chemical reagent and water into the flue gas inside an enclosure [while separately controlling the components of said mixture]

wherein said enclosure has an inlet and an outlet for the gas; and

- (b) collecting the products of the chemical reaction and particulates inside said enclosure with [the] water condensate on a solid surface, also inside said enclosure, whose temperature [does not exceed] is kept from exceeding the dew point temperature of the gas by heat transfer to an external cooling means.
- 11.(currently amended) The process according to claim 1 wherein [said mixture is] <u>chemical</u> reagent and water are sprayed into the gas by an injector [means].
- 12.(canceled) The process according to claim 1 wherein said enclosure has an inlet means to allow entry of the gas.
- 13.(canceled) The process according to claim 1 wherein said enclosure has an outlet means to allow exit of the gas.
- 14.(currently amended) The process according to claim 1 wherein said [solid surface is cooled by a cooling means] external cooling means is a plurality of air-cooled cooling fins.
- 15.(currently amended) The process according to claim 1 wherein said solid surface is cleaned of collected condensate [, products of the chemical reaction] and particulates by a [cleaning means] <u>plurality of scrapers</u>.
- 16.(currently amended) The process according to claim 1 wherein the amount of chemical reagent [in said mixture] is controlled by a chemical reagent supply flow [control means] controller.
- 17.(currently amended) The process according to claim 1 wherein the amount of water [in said mixture] is controlled to prevent supersaturating the gas by a water supply flow [control means] controller.
- 18.(new) The process according to claim 1 wherein said external cooling means is a water jacket.
- 19.(new) The process according to claim 1 wherein said external cooling means is a refrigerant.
- 20.(new) The process according to claim 1 wherein said solid surface is cleaned of collected condensate and particulates by a water spray.